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Development of automated test system for diesel engines based on fuzzy logic

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Abstract

© 2016 IEEE.To control a diesel engine during testing, the principles of fuzzy output, which are widely used in fuzzy-logic controller development, could be applied. The controller's main task is to monitor an external object, in which case the behavior of the monitored object is described with the fuzzy rules. The most important application area of the fuzzy set theory is the fuzzy logic controllers. Their operation slightly differs from the operation of common controllers. In order to describe the system, the expert knowledge is used instead of differential equations. Control of the automation systems for engine testing (AST) with the fuzzy-logic controller should be based on a knowledge database with fuzzy rules. Such database could be created with expert knowledge, neural network, or direct measuring method. Development of an adaptive control system for diesel engine testing process based on the fuzzy logic enables simplification of the system's structural components and provision of discrete control procedure with some uninterruptible properties, which could improve the control and reduce the scope of the knowledge database. Fuzzy logic makes it simple to input a priory information about an object in the form of fuzzy control rules into the adaptive control system. Similarity of form and natural language relatively easy allows obtaining necessary expert knowledge. A prior information provides one of the key initial conditions of the system developed according to adaptive control method-the condition of supreme initial adaptation.

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Keywords

database, diesel, fuzzy, system, test

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